Survey relationship between haemoglobin level and blood glucose with the risk of pressure ulcers development in patients after open-heart surgery

Objective: This study was conducted to investigate the relationship between haemoglobin and blood glucose levels with the risk of pressure ulcer development in patients after open-heart surgery. **Background:** Patients with chronic diseases are at high risk of developing pressure ulcers and it is still a major problem in the intensive care unit. The incidence of pressure ulcers in patients undergoing cardiac surgery is reported as 45–47%. **Methodology:** This descriptive study was conducted on 82 patients undergoing cardiac surgery in the special open-heart surgery unit at the Qazvin Bu-Ali Sina hospital (Iran) from March 2016 to April 2016. The Braden scale was used to predict pressure ulcer risk. In addition, the researchers recorded demographic data and haemoglobin and blood glucose levels on a daily basis. Data were collected using patient records and observation and were analysed using descriptive statistics, Pearson correlation coefficient and Independent t-test via SPSS software. **Findings:** Pressure ulcers were observed in 27 patients after open-heart surgery. There was no significant correlation between haemoglobin and blood glucose levels and pressure ulcer risk. However, blood glucose levels in patients with a pressure ulcer were lower than those without a pressure ulcer within the first 3 days of hospitalisation. **Conclusion:** The findings of this study can be utilized in planning for examining pressure ulcers in patients after open-heart surgery. The main risk factors associated with increased pressure sore risk included increased duration of hospitalisation and increased age. Patients should be consistently checked by nurses for signs of pressure ulcer development

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Pressure injury is localised damage to the skin and/or underlying tissue that usually occurs over a bony prominence as a result of pressure, or pressure in combination with shear and/or friction (National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance (NPUAP/EPUAP/PPPIA), 2014). A pressure ulcer is tissue damage caused by blood flow restriction and occurs when a patient's tissue is exposed to high levels of pressure for an extended period of time (Moore and Webster, 2013). This damage often occurs in people who are unable to change their position to reduce the pressure on their bony prominence (Moore and Webster, 2013). The development of a pressure ulcer is a complicated and multifactorial process and many mechanisms and factors lead to tissue damage, induced by pressure and/or friction (Demarre et al, 2015). Among these factors we can refer to oxygen deprivation, impaired lymphatic drainage (Demarre et al, 2015), ageing, long-term hospitalisation, history of cardiovascular disease and diabetes (Tayyib et al, 2015).

In developed countries, the prevalence rate of pressure ulcers is 3–30% and the incidence rate is between 1 and 50% (Karimian M et al, 2016). In developing countries, there is very little information on the prevalence of pressure ulcers and there are no records that assess and manage pressure ulcers, although the prevalence of pressure ulcers is likely to be higher in these countries (Alja'afreh and Mosleh, 2013). The incidence of pressure ulcers in Iranian hospitals is 5 to 32.9% (Rafiei H et al, 2015). Patients with acute and complex diseases are prone to complications because